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The Tech
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WEATHER, p. 2

FRI: 71°F | 66°F
Showers/T-Storms

SAT: 79°F | 59°F
Chance storms

SUN: 77°F | 59°F
Sunny

Volume 134, Number 28

Friday, June 13, 2014

MIT's board elects its next chairman

Millard was Lehman Bros. exec

By Leon Lin
NEWS EDITOR

The MIT Corporation named its next chairman, Robert B. Millard '73, at last Friday's elections. He will assume his new role as the head of MIT's board of trustees in October.

Millard is the chairman of Realm Partners, a hedge fund launched after the demise of Lehman Brothers, where Millard had become a managing director in 1983. He has held various positions within the MIT Corporation and the MIT Investment Management Company since 2003, according to MIT.

The current chairman of the MIT Corporation, John Reed '61, turned 75 earlier this year and is therefore stepping down per tradition, according to Millard. Reed became chairman in June 2010.

In a statement, President L. Rafael Reif praised both Millard and Reed.

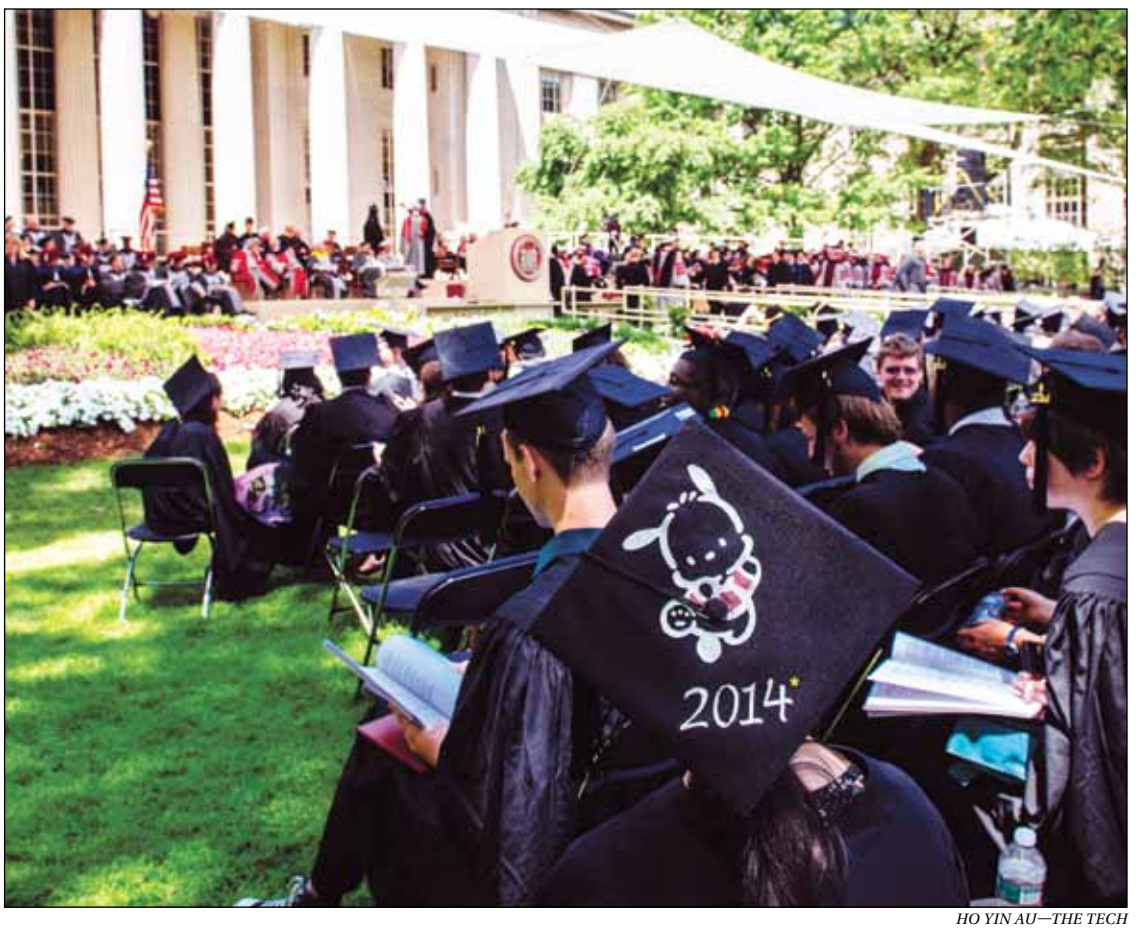
"John led a smooth transition from President Hockfield's presidency to mine, and he played a central role in preparing the Institute for the next capital campaign." Reif said, referring to an ongoing fundraising effort expected to inject billions of dollars into MIT's endowment. "To these and other critical pieces of MIT business, John brought imagination, focus, and a steady hand."

And of Millard, Reif said: "Humble, a critical thinker, a problem solver, and a doer, Bob has a way of constructively asking insightful questions and of getting people to focus on the most important long-term strategic issues."

Millard holds a bachelor's in architecture from MIT and an MBA from Harvard. Apart from his work at investment firms, he is the president of a timber company in Maine and a co-founder of L-3 Communications, an electronics and communications supplier.

Both Millard and Reed have agreed to be interviewed by *The Tech* at a later date.

The Corporation also elected 11 term members last week, all of them current or former top executives in the private sector.



HO YIN AU—THE TECH

MIT's 148th Commencement was on Friday, June 6. Over 2,700 students graduated, receiving over 3,400 degrees.

MIT fusion reactor is focus of power play in Washington

Facing funding crunch, Institute enlisted lobbyists

By Tracy Jan
BOSTON GLOBE

CAMBRIDGE — Senator Elizabeth Warren placed her hand atop a large red button and pressed firmly, restarting a nuclear experiment that MIT believes could help save the planet — but which the Obama administration considered superfluous and tried to kill year after year.

More than 100 scientists, engineers, and technicians — most of whom had, until recently, been under layoff notices — had gathered on campus that cold February day, their eyes glued to the three projection screens hanging from the front of the control room.

Then as superhot plasma inside the fusion reactor next door reached its metal walls, a flash of light appeared on one of the screens. The grand energy experiment had throbbed back to life.

And applause filled the room.

The dream could not be bigger: produce nuclear power without the radioactive waste or meltdown potential; generate an unlimited clean source of energy by replicating the sun's power on Earth. The federally funded research project for what is known as nuclear fusion has been, for more than a decade, the single largest science experiment for the Massachusetts Institute of Technology, in terms of employees and budget.

But the Obama administration, while sharing the hope that

Alcator, Page 8

Math department head appointed new dean of science

Professor Michael Sipser, the head of the math department since 2004, will serve as the new dean of the School of Science, MIT announced last week.

Sipser has served as interim dean since the previous dean of science, Marc Kastner, stepped down last December after being nominated to lead the Office of Science in the U.S. Department of Energy.

Sipser has been a member of CSAIL since 1979 and a member of the MIT faculty since 1980.

He is the author of the widely used textbook *Introduction to the Theory of Computation*. He has been the head of the math department since 2004.

In an email to the MIT community last Thursday, Provost Martin A. Schmidt PhD '88 praised Sipser for his ability to seek facts when problem solving and "arrive at balanced solutions."

Schmidt also wrote that Sipser was "instrumental in working with donors to raise the funds to renovate Building 2."

Sipser said in an statement last week that "our community of faculty, students, and staff in the School of Science is extraordinary, and I'm honored to serve our people as dean."

—Alexandra Delmore

ALEXANDER C. BOST—THE TECH

A new tree was recently planted outside of W20, filling the arboreal void left when the previous tree was cut down last January.

COMMENCEMENT 2014, pp. 6-7

IN SHORT

Pre-registration for returning students must be initiated by this Monday, June 16. Returning students must also indicate all CI-H and CI-HW preferences by this date.

Degree applications for September SB and Advanced Degrees are due today.

Nominate professors and staff to participate in a Dancing with the Stars event sponsored by the MIT Ballroom dance team by Sunday. Find the nomination form at *http://www.goo.gl/JGnxUM.*

Send news information and tips to *news@tech.mit.edu.*

WANT YOUR OWN DRONE?

Think again — it may not be legal. Read this column before you buy one. **OPINION, p. 4**

WHERE DID OUR SENIORS GO?

Inside *The Tech*! See our coverage of this year's Commencement in all its beautiful, full-color glory. Sunny skies, warm weather, happy faces... what's not to envy? **pp. 6–7**

IT DOESN'T TAKE TWO TO TANGO

Just the best Argentinian steak in town is enough for these two food aficionados. **ARTS, p. 12**

LET'S TALK ABOUT THE WEATHER

Not because we're in an elevator, but because it's the new PhD comic! **FUN, p. 5**

SECTIONS

Bergdahl to return to US on Friday morning, official says

WASHINGTON — Sgt. Bowe Bergdahl, the U.S. prisoner of war freed on May 31 in exchange for five senior members of the Taliban, will return to the United States on Friday morning to begin treatment at a Texas military medical facility, a Defense Department official said.

It will be the start of a new phase in what military officials describe as a multistep healing process for Bergdahl, 28, who was held captive for nearly five years by the Taliban. Since his release to U.S. commandos in Afghanistan, he has been receiving medical treatment and counseling at a U.S. military hospital in Landstuhl, Germany.

The process — likely to last weeks or longer — is expected to end with a carefully choreographed reunion with his parents in Hailey, Idaho. Military officials said Bergdahl has had no direct contact with them since his release.

President Barack Obama's decision to negotiate for the release of Bergdahl in exchange for the Taliban detainees, who were being held at the U.S. prison at Guantánamo Bay, Cuba, ignited anger among members of Congress and critics who equate freeing Taliban detainees with bargaining with terrorists. Lawmakers in both parties have objected to the move, saying Obama did not consult adequately with them about Bergdahl's impending release.

Some members of his former unit, who say Bergdahl deserted by walking off his post, are also angry that lives were put at risk in the search for him.

As the uproar has continued in the United States, Bergdahl has been cloistered at the Landstuhl hospital without access to television or the Internet, officials said. But some details of his imprisonment by the Taliban have emerged, including accounts that Bergdahl was held in a cage as punishment for one or two attempts to escape.

At Brooke Army Medical Center in San Antonio, Bergdahl is expected to receive treatment the military has designed for soldiers freed from lengthy captivities. Many of the protocols the military has established to handle such patients were first developed during the Vietnam War.

—Julie Hirschfeld Davis and Eric Schmitt, The New York Times

Confirmations to Fed board may strengthen Yellen's hand

WASHINGTON — The Senate on Thursday brought the Federal Reserve Board a little closer to full strength, confirming Lael Brainard, a former Treasury Department official, to one of the three open seats by a vote of 61-31.

The Senate also confirmed Stanley Fischer as the Fed's vice chairman by a vote of 63-24; it had confirmed his appointment to the board last month. Jerome H. Powell, a current member of the seven-person board, was confirmed to a new term by a vote of 67-24.

Brainard is expected to be sworn into office before the scheduled meeting next week of the Fed's policymaking committee. Brainard has given little public indication of her views on monetary policy, but analysts expect her arrival — alongside Fischer's last month — to strengthen the hand of the Fed's chairwoman, Janet L. Yellen, who has championed the Fed's focus on job creation and wants to retreat slowly from its stimulus campaign.

The arrival of Fischer and Brainard also ends a period in which presidential appointees have not held a majority of votes on the powerful policy-making committee.

The 12 voters on the Federal Open Market Committee always include five presidents of the Fed's regional banks, who are hired by those banks, while in recent months the number of Fed governors had dipped as low as three.

President Barack Obama has yet to announce nominations to the remaining vacancies on the Fed's board, but the White House has signaled at least one of the two vacancies will be filled by someone with community banking experience.

—Binyamin Appelbaum, The New York Times

Iraqi Kurds take oil city as militants push forward

By Tim Arango, Suadad Al-salhy and Alan Cowell
THE NEW YORK TIMES

ERBIL, Iraq — Iraq's fracturing deepened Thursday as Kurdish forces poured into the strategic northern oil city of Kirkuk after government troops fled, while emboldened Sunni militants who seized two other important northern cities this week moved closer to Baghdad and issued threats about advancing into the heavily Shiite south and destroying the shrines there, the holiest in Shiism.

The rapidly unfolding developments came as Prime Minister Nouri al-Maliki's entreaties for emergency powers stalled because of inaction by parliament, which seemed paralyzed.

The inability or unwillingness of al-Maliki's armed forces to hold their ground only compounded the crisis.

The U.S. government's apparent rejection of al-Maliki's requests for airstrikes on the Sunni militants reflected a deep reluctance by the Obama administration to re-entangle the U.S. militarily in Iraq.

But President Barack Obama, offering his first detailed comments on the Iraq crisis, told reporters at the White House on Thursday that his national security advisers were examining "all options" on how to stop the Sunni militant advances.

There were unconfirmed reports that Iran, an ally of al-Maliki's Shiite-led government, had sent Revolutionary Guards into Iraq to help him fight the Sunni militants.

Kurdish officials said Thursday that their forces had taken full control of Kirkuk in northern Iraq, a city dear to many Kurds, as government troops abandoned their posts there.

Militants aligned with the jihadist Islamic State of Iraq and the Levant swept across the porous border from Syria on Tuesday to overrun Mosul, Iraq's second-largest city.

They have been driving toward the capital since then, capturing the town of Tikrit, the birthplace of Saddam Hussein, seizing parts of the oil refinery city of Baiji and threatening Samarra, a city sacred to Shiites just 70 miles north of Baghdad.

With its oil riches, Kirkuk has long been at the center of a political and economic dispute between Kurds and successive Arab governments in Baghdad.

The disappearance of the Iraqi army from the city Thursday appeared to leave Kirkuk's fate in the Kurds' hands.

The urgency was underscored Thursday when an insurgent spokesman, Abu Mohammed al-Adnani, exhorted the militants to advance on the Iraqi capital..

After overrunning Mosul and Tikrit, the insurgents poured down the main north-south highway to reach Samarra.

On the way, the insurgents were said to have taken positions in parts of the important refining town of Baiji, north of Tikrit, but there were conflicting accounts Thursday as to who was in control there and whether the refinery was operating.

In Brazil, jeers and cheers for government and FIFA

By Simon Romero
THE NEW YORK TIMES

SÃO PAULO — Protests erupted on the streets of Brazil's largest city Thursday just hours before the opening of the World Cup soccer tournament, with the police dispersing demonstrators with tear gas and rubber bullets near the stadium where Brazil was to play against Croatia.

While a festive mood began emerging in other parts of São Paulo and elsewhere in Brazil, the intensity of the crackdown on the relatively small protests by the police seemed to stun the protesters, who numbered in the hundreds and were voicing opposition to Brazil's spending on the monthlong event. Several protesters and journalists were injured in the tumult, including a producer for CNN.

"The police response was absurd," said Paula Machado, 24, an English teacher who was among the protesters. "This is a violation of our rights."

Tension persists around the country over the tournament, with simmering resentment among many people about spending on the World Cup, estimated at $11 billion.

In São Paulo, the protesters were largely peaceful, carrying banners criticizing FIFA, the organization overseeing international soccer and the World Cup. But at certain points some masked demonstrators also threw rocks and bottles in the direction of police, while lighting piles of garbage on fire in the street.

A small protest against the World Cup also unfolded in downtown Rio de Janeiro, with the police dispersing hundreds of protesters by firing rubber bullets in their midst.

A strike by airport workers in Rio was suspended according to Brazilian news reports, but only after causing missed flights for some World Cup visitors at the city's largest airport.

Elsewhere, a strike by bus drivers began in Natal, a host city in northeast Brazil where the United States will play against Ghana on Monday. Hundreds of doctors in the city's public health system also went on strike. Brazil's government said it was sending 4,700 federal troops to help maintain order in the city.

In the immediate vicinity of the stadium, the police presence was strong, with police officers or mobile units present at almost every turn.

Brazilian fans, the majority wearing yellow jerseys or bandannas, posed with Croatian fans wearing their red-and-white checkered jerseys underneath a wall display that was a tribute to the history of the Corinthians, one of São Paulo's largest soccer teams.

WEATHER

Storms to soak Boston area

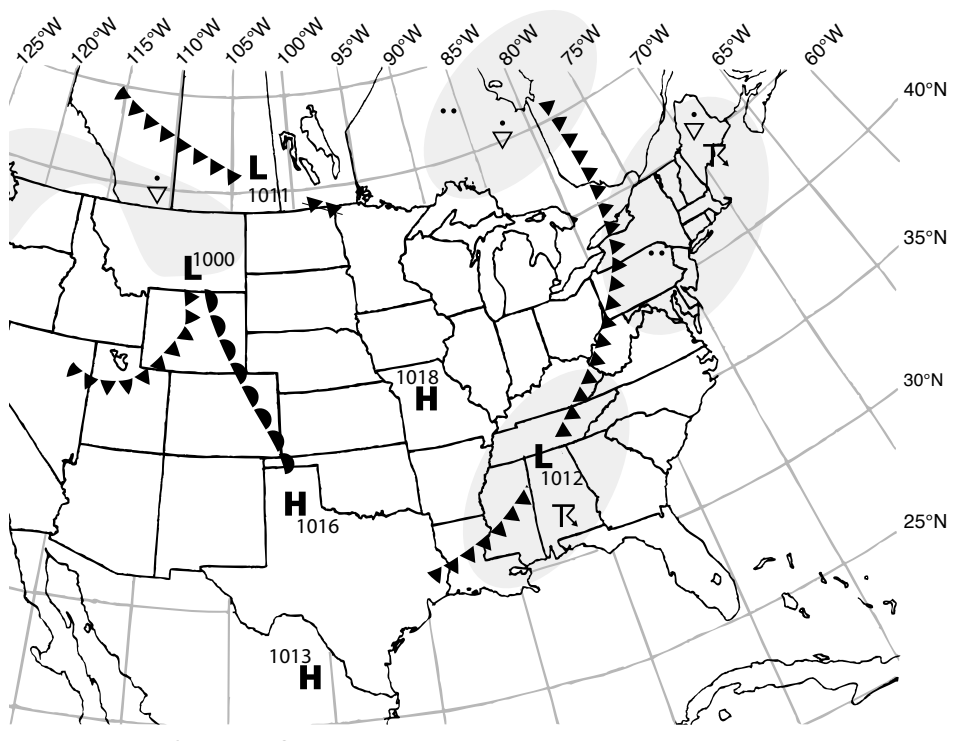
By Vince Agard
STAFF METEOROLOGIST

The Institute will get wet today as a storm system that caused wind damage in several locations in the Mid-Atlantic moves northward over our region. Rain showers will move through the area throughout this morning and this afternoon, bringing with them the occasional heavy downpour, gusty wind, or rumble of thunder. Fortunately, these storms have weakened since striking the Mid-Atlantic on Wednesday, so significant damage or dangerous conditions are not expected. In all, less than an inch of rain should accumulate today — a much more manageable amount than was received on this day in 1998, when intense storms drenched eastern Massachusetts in over 5 inches of rain, and caused over 5 million dollars in property damage.

After today, things will clear up for the remainder of the weekend. With the exception of a brief shower possible tomorrow morning, sunshine and warm temperatures will make for pleasant weather on Saturday and Sunday. While temperatures will approach the 80-degree mark tomorrow, an afternoon sea breeze will preclude Sunday from being quite as warm. Sunshine will continue into Monday before another storm system approaches in the middle of next week.

Extended Forecast

Today: Showers and thunderstorms, becoming heavy at times. High 71°F (22°C), with winds from the SE at 10-15 mph (becoming gustier in storms).
Tonight: Cloudy with showers ending, low 66°F (19°C). Winds SW at 5-10 mph.
Tomorrow: A chance of showers early, otherwise sunny. High 79°F (26°C), with NW wind at 5-10 mph.
Sunday: Sunny, highs in the upper 70s °F (25°C).
Monday: Mostly sunny, highs near 80°F (27°C).



Situation for Noon Eastern Time, Friday, June 13, 2014

Weather Systems	Weather Fronts	Precipitation Symbols			Other Symbols
			Snow	Rain	
H High Pressure	Trough	Showers	✻ ▽	• ▽	Fog
L Low Pressure	Warm Front	Light	✻	•	Thunderstorm
§ Hurricane	Cold Front	Moderate	✻✻	••	Haze
	Stationary Front	Heavy	⁂	∴	Compiled by MIT Meteorology Staff and *The Tech*

Cantor forgot Virginia roots, voters contend

By Trip Gabriel
THE NEW YORK TIMES

GLEN ALLEN, Va. — Here in the place that Rep. Eric Cantor calls home, few voters seemed to recognize him as one of their own. Despite Cantor's rise to the second-most powerful member of his party in the House and for a time a leader of its angry right flank, Republicans here seemed in agreement with Cantor's challenger who toppled him from power by tarring him as insufficiently conservative on issues including immigration, the federal budget and crony capitalism.

But more than any specific issue, voter after voter had a more fundamental complaint: At a time of deep cynicism about government, they described Cantor as a man who had succumbed to Washington and forgotten where he came from.

And amid the widespread rage of Republican voters at the Obama administration, the line between a leadership position and being sufficiently antagonistic to the White House proved to be impossible for Cantor to navigate.

"People are sick and tired of him — sick and tired of the way government is nowadays," said David Moffett, 60, who entered a Martin's market holding a shopping list for milk, salad, chicken and potatoes. "This country needs to get back to the way it was."

The no-budget campaign of David Brat, the college economics professor who unseated Cantor, spread its message through social media, including a web video of Cantor beside President Barack Obama at the State of the Union address.

To be sure, issues important to the conservative base drove the local Tea Party activists who provided Brat with a de facto campaign structure in the absence of the support of any national conservative groups.

The issue of "amnesty" for immigrants in the U.S. illegally has reignited with grass-roots conservatives, who see in the recent wave of unaccompanied children crossing the Mexican border a direct response to efforts by Obama, as well as some Republicans, to shield some young immigrants from deportation.

The Brat campaign portrayed Cantor as two-faced — opposing a comprehensive immigration overhaul as passed by the Senate, but "telegraphing" that he wants to find a way to let the so-called Dreamers, children brought in illegally by their parents, stay.

Like many places, the 7th Congressional District has a growing Latino population, although it is still small: 5 percent of residents are Hispanic, 77 percent are non-Hispanic whites, 14.5 percent are black and 4 percent are Asian, according to the 2010 census.

Larry Nordvig, executive director of the Richmond Tea Party, said that although a menu of issues drove voters, including immigration, "there was already an undercurrent of 'anybody but Cantor.'"

Even those who voted for Cantor did not sound terribly upset with the result. They included Spencer, the retired handyman.

"I will say straight up I didn't agree with everything he does," he said. "The people in the district have spoken. Mr. Brat is the man in charge now."

US drone hits Pakistan for 2nd time in 12 hours

By Declan Walsh and Ismail Khan
THE NEW YORK TIMES

LONDON — An American drone struck a militant compound in Pakistan's tribal belt for the second time in 12 hours on Thursday, killing at least 10 suspected members of the Haqqani network in a suddenly intense resurgence of the controversial CIA offensive in Pakistan.

The U.S. drone strikes, after an almost six-month lull in the operations while Pakistani officials tried and failed to negotiate a peace deal with the Taliban.

The strikes, both of which were reported to have killed Haqqani operatives, also came two weeks after the release of the U.S. soldier Sgt. Bowe Bergdahl, who had been a hostage of the Haqqanis for five years. A former U.S. military commander has suggested that Bergdahl's safety now would give more freedom to strike at the Haqqanis, who are fighting to overthrow the U.S.-backed civilian government in Afghanistan.

Pakistani security officials said Thursday that a CIA drone had fired six missiles at the compound four miles north of Miram Shah, the main town in North Waziristan.

The Haqqani group, headed by Sirajuddin Haqqani, has carried out numerous attacks on U.S. and Afghan security forces, as well as hotels and embassies in Kabul, the Afghan capital.

U.S. drone strikes are deeply unpopular in Pakistan and usually met with vehement criticism from the government.

In private, some Pakistani officials say they quietly support drone strikes when they suit Pakistan's perceived self-interest.

But a senior Pakistani security official, speaking on the condition of anonymity, insisted that the action did not have prior approval from the Pakistani authorities.

The long lull in CIA strikes coincided with a concerted effort by Prime Minister Nawaz Sharif's government to draw the Pakistani Taliban into peace talks. But that effort has all but collapsed in recent weeks.

Moreover, an audacious Taliban assault on the Karachi airport on Sunday, resulting in 36 deaths, bolstered public support for a military operation.

But in the days since the Karachi attack, military officials have hinted that plans are underway for a major operation, mostly likely in Waziristan. And the collapse in peace talks with the Taliban forced even Sharif's political rival Imran Khan to concede, some weeks earlier, that force should be used against militants who refuse to lay down their weapons.

The Pakistani Taliban presented the Karachi airport assault as a joint operation with the Islamic Movement of Uzbekistan, which has firmly established itself in the jihadi firmament of Waziristan since September 2011. Pakistani officials said that at least three Uzbek fighters died in the CIA strike Wednesday night.

Private health care exchanges enroll more than predicted

By Ann Carrns
THE NEW YORK TIMES

Employers are moving more quickly than forecasted to offer health insurance to their workers through private exchanges, according to new data from Accenture, a consulting firm.

Three million people signed up for workplace health coverage for this year through private exchanges, Accenture said. That's roughly three times the number of people the firm had estimated last fall would enroll for coverage through the private exchanges — online systems that are separate from the state and federal health insurance marketplaces.

The growth was driven largely by smaller and midsize companies — those with no more than 1,000 employees, said Rich Birhanzel, who leads Accenture's health administration services.

Accenture estimates that total enrollment in private exchanges by active employees will reach about 40 million by 2018, surpassing the number of people enrolling through state and federally funded exchanges.

Private exchanges are similar to the public marketplaces but are offered by employers to their employees. Consulting companies, including Aon Hewitt, Mercer, Towers Watson and Buck Consultants, operate private exchanges, and some insurers also offer their own versions. Walgreen and Sears, for instance, participate in Aon Hewitt's offering, known as the Corporate Health Exchange.

Some employers are shifting employees to the exchanges to control costs and reduce administrative burdens, and to give workers more plans to choose from. (The idea is that offering plans from multiple insurers will help lower costs through competition.)

Roughly a quarter of employees who signed up through the private exchanges ended up with less coverage than they had under employer plans, Birhanzel said. They might have chosen to lower their monthly premiums or chosen to trade off some health coverage for other types of coverage — like disability insurance or life insurance — offered through the exchanges.

Lowering health insurance premiums generally means higher deductibles — the amount you must pay for care before coverage begins. High-deductible plans typically come with lower monthly premiums, but employees are responsible for more out-of-pocket costs.

The shift toward higher out-of-pocket spending has implications for doctors and hospitals as well as for patients, Birhanzel noted, in that they will be faced with collecting a greater share of payments directly from patients, rather than from insurers. Accenture estimates that out-of-pocket collections from patients with employer-based coverage will increase by 7 percent by 2018.

Former New York Times editor to teach at Harvard

Jill Abramson, the former executive editor of The New York Times, will teach undergraduate courses in narrative nonfiction at Harvard this fall, the university announced Thursday.

Abramson was abruptly dismissed last month by the newspaper's publisher, Arthur Sulzberger Jr. Her firing, less than three years after she was appointed the paper's first female executive editor, stunned The Times newsroom and the media world.

Sulzberger said she was dismissed because of her management style. Some published accounts speculated about whether gender played a role or whether she was let go because she complained that her compensation was less than that of her predecessor, Bill Keller, an accusation that Sulzberger denied. The dispute played out in articles by The New Yorker, Vanity Fair and dozens of other news and media outlets.

Harvard said in a statement that Abramson would be a visiting lecturer in the Department of English for the 2014-15 academic year and would teach in the fall and spring semesters. In the statement, Abramson said she was "honored and excited."

Narrative nonfiction, she said, "is more important than ever. Its traditions and how it is changing in the digital transition are fascinating areas of study."

Abramson previously taught journalism seminars at Yale and Princeton.

Abramson, a 1976 Harvard College graduate, has a tattoo featuring the school's H logo, as well as a tattoo of the T from The New York Times masthead.

She was replaced as the top editor of The Times by Dean Baquet, who had been her No. 2, the paper's managing editor.

—Ravi Somaiya, The New York Times

In India, another woman is hanged from tree

NEW DELHI — The body of a 19-year-old woman was found hanging by her scarf from a eucalyptus tree in a village in the Indian state of Uttar Pradesh on Thursday morning, the police said.

It was the third similar gruesome discovery in the state in two weeks.

Relatives of the dead woman, who was last seen alive Wednesday, have filed a report alleging that she was raped and murdered by two men who they say had been bothering her, according to Jagdish Singh, an official at the police station where the complaint was filed.

Singh said that no arrests had been made in the case.

R.K. Saxena, the district police information officer, said in a telephone interview that a preliminary postmortem examination found no external injury marks to suggest that the woman had been raped.

Pressure has been mounting on the chief minister of Uttar Pradesh, Akhilesh Yadav, over the deaths. Yadav has resisted calls for his resignation, saying that comparable crimes had occurred elsewhere and that law enforcement "is fine in U.P. and better than in many other states."

Yadav made the comment in New Delhi, where he was meeting with potential investors Thursday.

Many Indians were horrified two weeks ago by the news that two teenage cousins had been found dead, hanging by their scarves from a mango tree, in the Baduan district of Uttar Pradesh.

An autopsy found that the cousins had been raped and then strangled.

Then on Wednesday, a 45-year-old woman was found dead in another part of the state, hung from a tree by her sari, according to The Indian Express, a daily newspaper. Relatives of the woman said she was gang-raped and murdered.

Separately, police officers at a local police station in the state were accused earlier this week of gang-raping a woman who went to the station to inquire about her husband's arrest.

—Malavika Vyawahare, The New York Times

Russia sees American 'adventurism' in Iraq behind current conflict

MOSCOW — Expressing alarm over the conflict in Iraq on Thursday, Russia said it had long predicted that U.S. and British "adventurism" there would end badly.

"We warned long ago that the adventurism the Americans and the British started there would not end well," said Sergey V. Lavrov, the Russian foreign minister, according to the Interfax news agency.

Without referring to President George W. Bush by name, Lavrov said, "The situation in Iraq has been deteriorating at an exponential rate" ever since the U.S. president declared a victory for democracy in Iraq 11 years ago.

The Russian foreign minister accused the United States of withdrawing its forces prematurely for domestic political reasons, without finishing the task of preparing the Iraqi military to protect the whole country.

Now, he said, Iraq is being overrun by terrorists and is at risk of breaking apart.

"Iraq's unity has been called into question," Lavrov told reporters at a news conference. "Terrorism is rampant there because the occupation forces paid virtually no attention to the internal political processes, and didn't facilitate national dialogue, but pursued their own interests exclusively."

Russia's foreign ministry published a separate statement on its website Thursday from its spokesman, Alexander Lukashevich, echoing those remarks.

The statement repeated that the "adventurism" of some Western nations led to the destabilization of Iraq.

"There is no doubt that those who invaded Iraq over 10 years ago, and continued to impose their decisions and their will on the nations of the region, abetted the start of the destabilization process to a large extent," said Lukashevich, adding that the results are now evident throughout the Middle East.

The foreign ministry also strongly condemned attempts by the "terrorists" to consolidate their strength in Iraq, Syria and other unspecified parts of the Middle East.

—Neil Macfarquhar, The New York Times

Law and Order in the skies

"Microdrones" are consumer products — and should be regulated that way

By Henry H. Perritt, Jr. and Eliot O. Sprague

On Tuesday, the Federal Aviation Administration (FAA) announced that it has approved oil company BP to perform drone flights to survey roads, pipelines, and other equipment in Prudhoe Bay, Alaska. This is the first commercial drone authorization and is a step forward in the effort to spread the commercial use of unmanned aircraft. It does not, however, represent a viable approach to regulating these aircraft. Alaska's remoteness is unrepresentative of the lower 48. Moreover, the drones approved for Alaska are adaptations of military fixed-wing models, and the approval is layered with restrictions pertinent to specifics of the vehicles and the territory.

The interesting technological revolution that is buzzing around the heads of regulators involves a different kind of drone — one with multiple helicopter-like rotors. These rotors combine the advantages of helicopter flight profiles with electric propulsion systems whose variable RPM eliminates the mechanical complexity associated with varying the pitch of spinning rotor blades.

Police officers, reporters, real estate agents, and farmers are rushing to buy thousand-dollar versions of microdrones, defying the FAA position that flying them is illegal. Calling them sUAVs (small Unmanned Aerial Vehicles) instead of "drones" is fruitless political correctness; the word "drone" will stick.

Anyone can buy one on Amazon and have it delivered the next day, ready to capture high-definition video and stream it back to the Drone Operator (DROP). Their utility in capturing news, supporting law enforcement, selling real estate, and patrolling pipelines and power lines for defects is obvious, and you don't have to have a pilot's license to fly them safely — even though the FAA says you do to fly them *legally*.

Congress is several steps ahead of the FAA. It said that the FAA was supposed to begin integrating drones into the national airspace system by 2013. It's now mid-2014, and the best the FAA can do is to reiterate its position that drone flight for commercial purposes is illegal.

Meanwhile, it vaguely promises an initial notice of proposed rulemaking sometime before the end of 2014, grudgingly granting a few special approvals for isolated geographic areas like Alaska, and expressing willingness to consider equally specific requests from Hollywood. Most people buying and using these vehicles don't care about the FAA's prohibition — indeed many of them are probably unsure of exactly what the FAA is.

This is only the latest example of regulatory decision-makers being straitjacketed by their pasts while technology makes the details of their regulations irrelevant. Young engineers — good young engineers — will know how to confront such regulatory challenges. They will understand that policy can be just as important as finding a technical solution. Their creativity will inform policymakers about how technology can supplement law.

Some form of regulation of drones is necessary. A 787 flight crew responsible for 300 passengers doesn't want to encounter a microdrone on final approach. A police or news helicopter pilot doesn't want to compete with small aviation outlaws for access to the skies over a fire or an active shooter scene. It would hurt like hell if a 12-pound bowling ball hit you on the head. Some microdrones weigh more than that.

The implications for personal privacy are important, but privacy is essentially a sideshow. Legal doctrines for protecting personal data are already crystallized, and privacy advocacy organizations are sophisticated in making their views heard and attended to in political and regulatory arenas. The main issues relate to safety, and the FAA needs to do its job in a realistic way.

Taking another five years to go through every line of the 500 pages of existing federal aviation regulations to mold the details of existing requirements for manned aircraft is not the right approach. Manned airplanes and helicopters cost anywhere from hundreds of thousands to tens of millions of dollars. Rules for their flight are implemented through professional pilots, mechanics, and directors of operations who have designed their careers around manned aircraft.

Instead, the FAA must recognize microdrones for what they are: inexpensive consumer products that put strikingly useful technologies within the reach of almost everyone.

The U.S. legal system knows how to regulate consumer products. Lawn mowers can't be sold unless they comply with basic Consumer Product Safety Commission requirements for guards and deadman controls. Smartphones and Wi-Fi points of presence are excluded from the market unless they meet FCC requirements that avoid interference with other spectrum users.

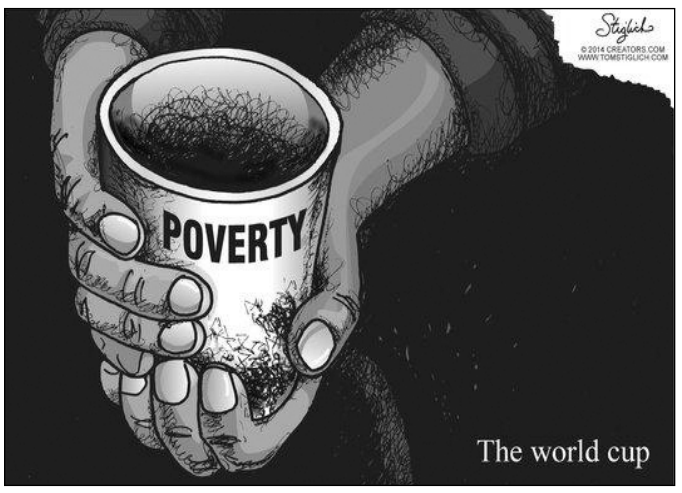
There's no need to license DROPs like aircraft pilots. Nor is there a need for hundreds of pages of detailed regulations prescribing flight altitudes, routes of flight, and human radio communication with air-traffic controllers. Whatever limitations are appropriate to ensure safety can be built into the microdrones themselves. They can be law-abiding when they come out of the box. Technology won't let them be flown in violation of the law.

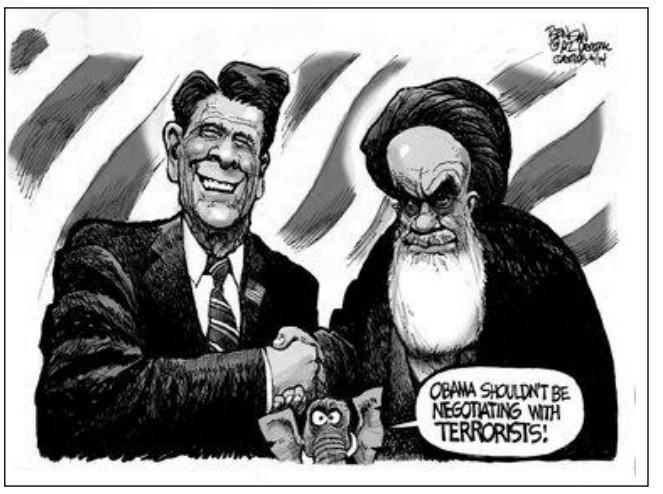
Microdrones already know how to do this. They can take off, hover, fly a GPS-defined grid, and return to their launching point autonomously. They can be programmed not to exceed particular heights above the ground and to stay within a certain radius of their DROPs.

Such autonomy, under a sensible regulatory approach, can be embedded in firmware and made extremely difficult for anyone to override. This is the only approach that will permit this new technological revolution to be channeled in a useful and safe direction. We all need it soon.

Technology creates risks, but it also provides a means to enforce the rules that reduce the risk.

Henry H. Perritt, Jr. '66 and Eliot O. Sprague manage Modovolate Aviation LCC, which conducts drone research, evaluation, demonstration, and education programs.





CORRECTIONS

A Campus Life article published last Friday on Mary Rowe's retirement from her role as one of MIT's two ombudsman incorrectly stated that she was head of the MIT Ombuds Office. Instead, she and fellow MIT ombudsman Toni Robinson are coequals. DEC was also incorrectly spelled DEQ in the list of companies which had ombudsman-like positions. A clarification was added to the "Drafting a Letter" process, indicating that the letter could be sent either to the offender or a supervisor.

OPINION POLICY

Editorials are the official opinion of *The Tech*. They are written by the Editorial Board, which consists of Chairman Annia Pan, Editor in Chief Austin Hess, Managing Editor Judy Hsiang, and Opinion Editor Jacob London.

Dissents are the signed opinions of editorial board members choosing to publish their disagreement with the editorial.

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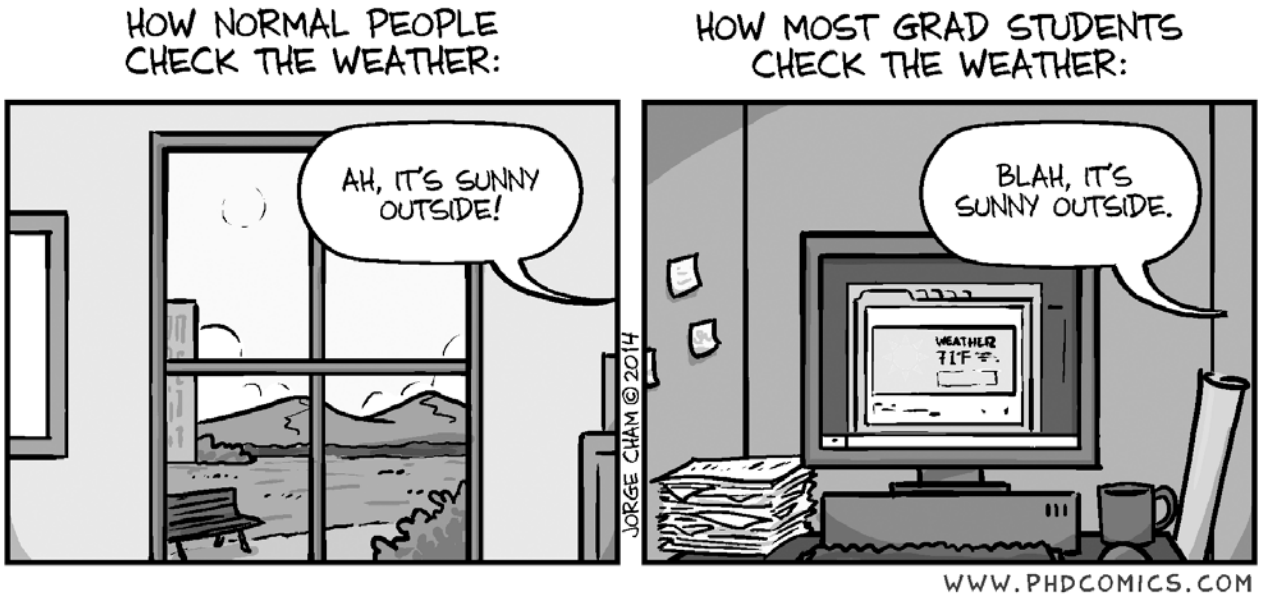
by Jorge Cham



FUNFUNFUNFUNFUNFUNFUN

Sudoku

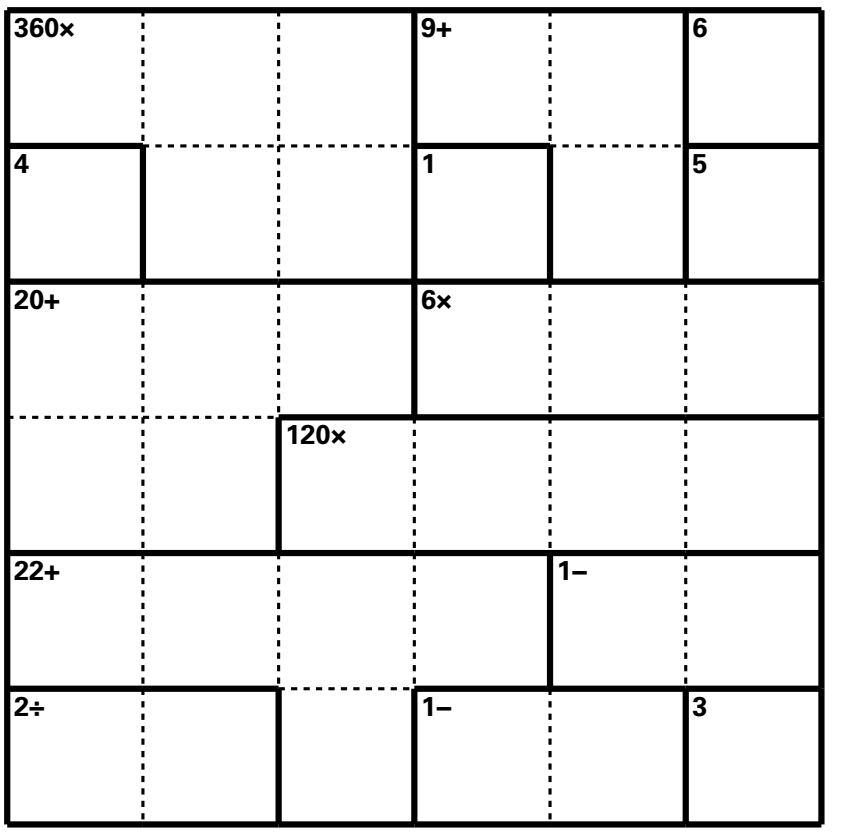
Solution, page 11

3			7	8		9		
		7						5
4					9	7		
	2		3		7		1	8
	5			6			7	
7	3		9		8		2	
		3	6					7
8						2		
		2		9	1			3

Instructions: Fill in the grid so that each column, row, and 3 by 3 grid contains exactly one of each of the digits 1 through 9.

Techdoku

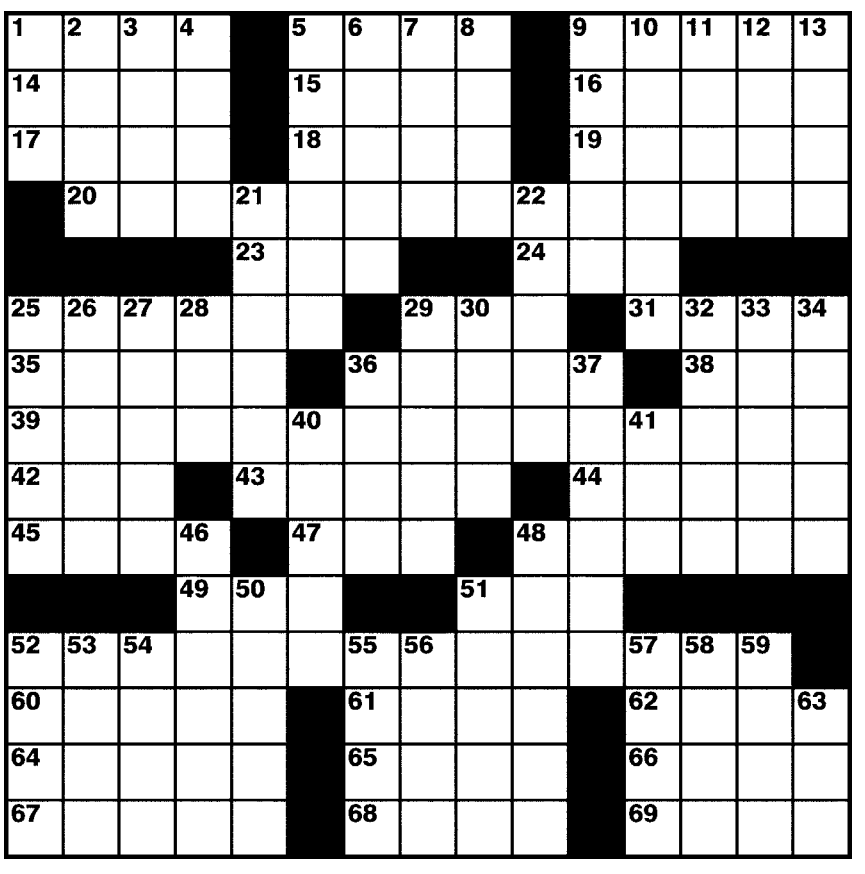
Solution, page 11



Instructions: Fill in the grid so that each column and row contains exactly one of each of the numbers 1–6. Follow the mathematical operations for each box.

Coffee Talk by Fred Piscop

Solution, page 11



ACROSS
1 Tater
5 DVD player ancestors
9 Sleeper's sound
14 Approximately
15 Grad
16 Health-insurance outlay
17 Noble act
18 iPod model
19 Major 2011 hurricane
20 Weapons testing sites
23 Pose a query
24 Rank above CPO
25 Bavarian capital
29 Transgression
31 Handful of hair
35 Tommy or Tosca
36 Aggressive personality
38 Nintendo game console
39 Is clueless
42 Discontinue
43 Whistle blasts
44 Canoeing locales
45 "__ we forget"
47 Hibachi residue
48 Too diluted
49 Computer screen pop-ups
51 Designer Claiborne
52 Company cars, expense accounts, etc.
60 Razor sharpener
61 Honey factory
62 Storage rental
64 Top-rated
65 Hovering above
66 Big galoot
67 Grannies
68 Golf goals
69 Ladled entrée

DOWN
1 Lawn material
2 Make ready, for short
3 Software purchaser
4 Dunce
5 Disappear suddenly
6 Sound of chains
7 Ladder level
8 Urban pollution
9 Descendant
10 "Take your time!"
11 Amenable (to)
12 Kentucky senator __ Paul
13 Needle holes
21 Available to rent
22 Freshen up
25 Runway strutter
26 Slightly ahead
27 Has to have
28 Tax agcy.
29 Moog's invention, for short
30 NYSE debuts
32 No longer sleeping
33 West Coast NFLer
34 __-face (affectionate)
36 Boxing refs' calls
37 On fire
40 Breakfast bread
41 Corrode
46 City south of Seattle
48 Rainy-day devices
50 Swindles
51 Brake pedal, e.g.
52 SportsCenter channel
53 More, in adspeak
54 Leprechaun land
55 Denny's rival
56 Start of a Spanish cheer
57 Chafes
58 Rope securer
59 Hat stat
63 Pull from behind

HO YIN AU—THE TECH

HO YIN AU—THE TECH

SHERRY REN—THE TECH

HO YIN AU—THE TECH

HO YIN AU—THE TECH

SHERRY REN—THE TECH

MIT's 148th Commencement

1. **A soon-to-be graduate marches into Killian Court.**
2. **Some students decorated their caps.**
3. **Ellen Kullman, Chair and CEO of DuPont, gave the commencement speech.**
4. **Anika Gupta '14, President of the Class of 2014, and President Reif** take a selfie during the presentation of the class gift.
5. **President Reif presents a diploma to Sidhanth P. Rao '14, President of the UA.**
6. **Diplomas lay stacked and ready to be handed out before the start of the ceremony.**
7. **Graduates flip their class rings during the ceremony as a part of MIT tradition.**

HO YIN AU—THE TECH

Reactor revived by lobbying campaign

Alcator C-Mod layoffs rescinded

Alcator, from Page 1

nuclear fusion will one day be harnessed as a power source, concluded that the MIT experiment was a waste of taxpayer money. It deemed MIT's facility outdated and small, the least scientifically useful of three domestic fusion reactors. Indeed, critics of the experiment said it amounts to a $1.5 million-per-student training program that MIT wants to keep going to protect its turf and prestige.

The White House believed that tax dollars were better spent on reactors in New Jersey and California, and it diverted some of the MIT money for a France-based international project of unprecedented scale. MIT's fusion experiment was slated for elimination in the 2013 and 2014 budgets.

"I personally would like to see us build the most modern type of machine. We thought the only way to do that was to do without MIT's," said William Brinkman, former director of the Office of Science at the Department of Energy. "But closing a facility is not an easy thing. It's a political hornet's nest."

This is a story about those "hornets" and that nest, about the extraordinary multifront lobbying campaign waged by one of the most powerful research universities in the country. It was an exercise of muscle along the Massachusetts-Washington axis that did something significant even on gridlocked Capitol Hill — restoring funding for a program axed by the White House.

"In the end, it is about picking a winner and a parochial effort to direct money to MIT," said Steve Ellis, vice president of Taxpayers for Common Sense, a Washington-based watchdog group. "It's certainly a case of lawmakers bucking the president and putting their thumb on the scale for a particular project."

MIT enlisted the support of a wealthy Democratic donor from Concord and the help of an influential Washington think-tank co-founded by John Kerry. These efforts were backed by lobbyists, including a former congressman from Massachusetts, with connections to the right lawmakers on the right committees. The cast also included an alliance of universities, industry and national labs, all invested in the fusion dream.

"It's ground-breaking research that could lead an energy revolution," Warren said. "This was not about politics. This was about good science."

The revival of MIT's project, whatever its merits, clearly demonstrated what the combination of old-fashioned Washington horse-trading and new-fangled power — both nuclear and political — can do.

Vast promise, little progress

A fading poster titled "Fusion, Physics of a Fundamental Energy Source" takes up nearly an entire wall of MIT's Plasma Science & Fusion Department's second-floor lobby. It reads: "If fusion power plants become practical, they would provide a virtually inexhaustible energy supply … substantial progress toward this goal has been made."

The poster was printed in 1996. The goal has remained elusive.

MIT's hopes lay with a 40-foot-tall cylindrical machine called the Alcator C-Mod, a 20-year-old nuclear fusion reactor housed in a long brick building that had once been a Nabisco cookie warehouse on the west side of campus.

Fusion produces energy when hydrogen nuclei combine, with helium as its harmless byproduct. The potential for nearly limitless, cheap, efficient fuel that does not harm the environment has long made nuclear fusion the "holy grail" of energy.

But the road from potential to reality has proved to be steep and littered with scientific obstacles.

MIT's fusion reactor, like most of its kind, uses a powerful magnetic field to confine plasma, an ionized gas whose atoms occasionally collide at temperatures exceeding 100 million degrees Celsius, nearly 10 times hotter than the core of the sun, to produce energy — for just a few seconds.

But for a fusion reactor to actually generate electric power, the plasma must become dense and hot enough to produce more energy than the reactor uses to create it — and the reaction has to be sustained continuously. A feat akin to creating a captive "star," it so far has not been achieved anywhere, despite decades of research and engineering efforts.

That daunting challenge has evoked skepticism in some quarters about fusion ever becoming a feasible energy source, at least not without much larger reactors.

The best hope for success in the eyes of the Obama administration is at the International Thermonuclear Experimental Reactor (ITER) being built in Cadarache, France. That ambitious worldwide collaboration, estimated to cost tens of billions of dollars, is where much of the scientific and political attention — and resources — have shifted.

The project, with the European Union, Russia, China, South Korea, Japan, and India as partners, was conceived in 1985 at a Reagan-Gorbachev summit in Geneva as the first step toward a commercially viable thermonuclear reactor. Construction is underway and experiments may begin in 2020.

At nearly 100 feet tall and weighing 23,000 tons, ITER will be 10 times larger than the MIT machine and will be able to hold 1,000 times the amount of plasma, increasing the potential for a scientific breakthrough.

After some wrangling, the United States has committed to supporting 9 percent, estimated at $4 billion to $6.5 billion, of what is the biggest international research and development project in history.

MIT believes its reactor will yield lessons that help seed the larger dream, allowing scientists to better understand the underlying physics of nuclear fusion and how to better control the turbulent and volatile plasma.

But to the Obama administration, the MIT project does not offer enough to justify the cost and needed to be scrapped in favor of more promising sites.

Energy Department officials said they prioritized the country's two other fusion reactors, run by Princeton University and by General Atomics, a San Diego company, over MIT's because they were more productive and important to the future of the international project.

The MIT reactor appeared doomed.

White House: Power down

In February 2012, just hours before President Obama unveiled his budget for the 2013 fiscal year, MIT's vice president of research received a call from the Department of Energy. The administration had decided: The university's reactor experiment was done.

The MIT reactor, which had received $28 million in fiscal year 2012, would get just $16 million in Obama's new budget. The money would pay the staff to ensure a safe shutdown of the reactor, but no more experiments would be run.

C-Mod, Page 10

Even in gridlocked Capitol, MIT won funds back

MIT invited Pelosi, others to campus after White House said reactor should be axed

C-Mod, from Page 8

The difference in the funding would be transferred to the international project.

"This was not a negotiation call. It was an information call," recalled Claude Canizares, an MIT physics professor and former vice president of research.

A couple of weeks later, Edmund Synakowski, who oversees fusion energy sciences at the Department of Energy, offered the rationale for the administration's decision during a meeting of fusion scientists.

ITER, the international collaboration, was the "frontier of burning plasma science," Synakowski said. The MIT reactor was not. If they want to continue their experiments, MIT scientists should travel to other reactors in the United States, Asia, and Europe.

It was a significant blow to the university, a longtime beneficiary of hundreds of millions a year of government research dollars, which has helped hone its reputation as an elite research institution.

And MIT was indignant. Earl Marmar, head of MIT's Alcator C-Mod project, defended his program, saying in an interview that its productivity is "as high or higher" than other reactors when judged by the number of scientific papers published and articles cited by outside researchers in the last five years.

But the MIT reactor was mothballed in October 2012 while scientists scrambled to finish analyzing data they had previously collected. The university stopped accepting new graduate students for the experiment. Dozens of researchers received pink slips and prepared to leave the field entirely.

The following spring, the Obama administration, in its 2014 budget request, provided zero funding, writing that the "research effort is ended as the facility is shut down completely."

In fact, it wasn't dead yet. It had simply entered another kind of force field: politics.

Juncture of science, politics

For years, Representative Michael Capuano prided himself on his skill in steering tens of millions of earmarked federal money to his district, home to MIT and other universities.

But a 2011 ban on congressional earmarks — pet projects funded without a merit-based review process — left politicians such as Capuano struggling to find new ways to channel money to their districts.

MIT's experiment had never been funded through an earmark. The university usually opposed the pork barrel practice, having no trouble winning federal research contracts through a competitive peer-reviewed system.

But in early 2012, the university's Washington lobbyists made Capuano, a Somerville Democrat, one of their first calls.

It was just the kind of fight Capuano relished, and he laid out a clear strategy. He toured MIT's reactor, met the scientists, and learned the basics of nuclear fusion.

"I asked them to speak English, to tone down the technological talk," Capuano said. "And then we talked about how to save it. It was very simple. My job was to get it back in... I have no idea if fusion is the real thing or unreal thing or if it will ever come to fruition. I just need to know it's a reasonable thing to be researching, that it's not tiddlywinks."

He first enlisted the support of members of Congress who are also scientists — Rush Holt, a New Jersey Democrat and physicist who had been the assistant director of the Princeton Plasma Physics Laboratory; Bill Foster, an Illinois Democrat and physicist; and John Olver, a Massachusetts Democrat and chemist and an MIT alum who at the time served on the House Appropriations energy and water development subcommittee.

Then, as MIT administrators pleaded their case with Department of Energy officials, Capuano built an argument to help MIT scientists — and the national fusion community — gain support amongst a broader group of House colleagues, an argument that would resonate with the Republicans in charge: Why would America want to directly send jobs and its intellectual elite to other countries?

"The average member of Congress can understand that," Capuano said. "On the House side, no one said 'to heck with that.' It was 'OK, Mike, we'll see what we can do.' We worked it little by little."

Holt, a well-respected longtime member of the New Jersey delegation, was a particularly effective ally because he had a direct pipeline to Rodney Frelinghuysen, a New Jersey Republican who at the time chaired the energy and water development subcommittee on appropriations and represented a neighboring district.

Holt and others credit Frelinghuysen for ultimately carrying the ball for MIT — and all domestic fusion programs. Frelinghuysen declined to comment.

On the Senate side, Warren assumed the role of lead advocate, touting MIT's research in letters and meetings in Washington.

"I'm learning how to do this in an elevator ride, on the walk over from the little subway car over to vote, to say, 'Have you heard about what we're doing at MIT?' " Warren said.

She spoke repeatedly with Senate appropriators, including what she described as "very productive conversations" with Barbara Mikulski, a Maryland Democrat and chair of Senate appropriations.

With the administration directing MIT to immediately cease all operations and present a plan for closure as quickly as possible in the spring of 2013, Frelinghuysen, Holt, Warren, and others appealed to Department of Energy officials to compromise.

All of these pressure points had worn down the White House. Instead of preparing to dismantle the reactor in 2013 as the administration had instructed, MIT and the Department of Energy agreed to keep the experiment on life-support status, using the $16 million to maintain the machine, so it would be easier to restart if a larger amount of funding came through.

Mr. Fusion, plus reactor tours

Enter the most unlikely player in this saga: a 74-year-old biotechnology entrepreneur from Concord, Mass., named Reinier Beeuwkes, a tall, bespectacled gentleman with thick, wavy white hair and a deep passion for the potential of fusion power.

Dubbed Mr. Fusion by lobbyists and lawmakers on the Hill, where he is a frequent presence, Beeuwkes says he has no financial ties to the fusion industry. A 1967 MIT graduate, Beeuwkes and his wife, Nancy, are top Democratic donors, having contributed nearly $1.9 million to political action committees and candidates in the last two election cycles.

Beeuwkes's most critical role was his support for a Washington-based bipartisan think tank called the American Security Project. The organization was founded in 2006 by a group of retired generals and senators, including Massachusetts Democrat John Kerry, to focus on national security issues.

Fusion became one of its primary issues in 2011 after Beeuwkes began giving money to the think tank and its lobbying arm, the American Security Action Fund. Neither Beeuwkes nor the American Security Project would disclose how much he gives to the organization's fusion strategy.

The organization hired two lobbying firms to build congressional support for domestic fusion funding, including for MIT. One firm was the Boston-based ADS Ventures, started by Chet Atkins, a former congressman from Massachusetts. Together, Atkins and Beeuwkes, a friend and former neighbor, worked to identify more than a dozen Washington lawmakers to invite to tour the reactor when they were in town for fund-raisers.

Those lawmakers included House Democratic leader Nancy Pelosi and Democratic Senators Mary Landrieu of Louisiana, Jon Tester of Montana, and Tom Udall of New Mexico — who serve on the energy and water subcommittee of Senate Appropriations. Beeuwkes and his wife have helped fund the election campaigns of some of the lawmakers.

"People who are calling up to ask for funds always ask you what matters to you, and I tell them," Beeuwkes said. "That's good politics."

The American Security Project also enlisted K&L Gates, a Washington firm, to work the halls of Congress and keep tabs on the appropriations process.

Their talking points emphasized maintaining America's leadership in the world and the potential for energy independence. In short, in 20 years, do we want to be buying it from the Chinese or selling it to the Chinese?

"People don't take fusion energy seriously enough," Beeuwkes said. "My efforts have been to get people who matter to take this seriously."

Beeuwkes's point person at the American Security Project was a Republican named Andrew Holland, the think tank's senior fellow for energy and climate as well as a lobbyist.

Holland and other MIT supporters argued in Congress and to administration officials that shuttering the fusion experiment would be short-sighted, closing a pipeline of graduate students trained to eventually use the international facility in France.

Economic repercussions from ending MIT's experiment would also ripple across the country, warned Holland. He created an interactive map showing all of the subcontractors linked to the MIT, Princeton, and General Atomics fusion reactors, as well as the international project, whose US headquarters are in Oak Ridge, Tenn.

The map, depicting how hundreds of subcontractors are spread in 47 of the 50 states, was particularly effective in persuading members to fight for more fusion funding, once they were able to visualize how their state, and constituents, were affected, Holland said.

MIT's reach, represented by an array of green dots, extends from dozens of fusion-affiliated businesses in Massachusetts across the country to Pennsylvania, New Jersey, Michigan, Illinois, Wisconsin, Ohio, Florida, Texas and California.

The multipronged battle to save MIT's project — and the ensuing national mobilization — has been a "wake-up call" for the entire fusion community, Holland said. The lesson: Science needs to be sold if it is going to be properly funded.

Fusion researchers, Holland said, are "happy to have it be a nice little science experiment. They're scientists. They're not political animals.

"They thought the Department of Energy would just give them a nice amount of money in perpetuity and they'd be able to experiment," he said. "This is too important to be left in the hands of the scientists."

From crisis, an opportunity

Out of last October's 16-day government shutdown emerged an opportunity for MIT.

A budget compromise struck between Representative Paul Ryan, a Wisconsin Republican who chairs the House Budget Committee, and his Senate counterpart Patty Murray, a Washington Democratic, in December would restore about $63 billion in automatic spending cuts over two years. Would fusion funding be a winner or casualty as that spending package ground toward a final vote?

The Republican-led House had already said yes to fusion, including continued funding for MIT's experiment.

But the Democratic-controlled Senate had continued to oppose it. Senator Dianne Feinstein, a California Democrat and chairwoman of the appropriations energy and water subcommittee, had gone along with the president's budget for 2014.

"Look, huge amounts of money go into these projects," Feinstein said during a subcommittee hearing of the Senate energy and water bill last June. "We can't keep funding if goals aren't reached."

In support of MIT, Senator Landrieu gave an impassioned speech during the hearing and expressed concerns that Obama's cuts to the domestic fusion program would hurt the country's scientists and universities.

"This is a big issue, it's a little bit out of my lane, but I've learned about it," Landrieu said, describing her visit to MIT's reactor. "I would strongly suggest a serious review of what's going on at MIT because I actually got to walk though the facility and was impressed with what they are doing."

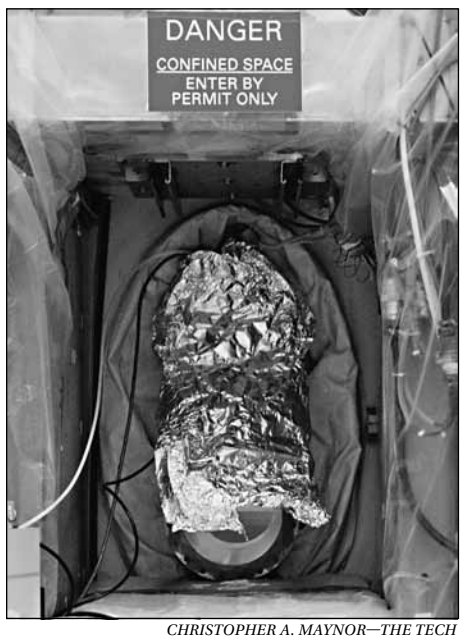
After months of lobbying, deal-making and congressional cajoling, it all came down to a closed-door bargaining session over the December holidays to head off another government shutdown. As is their way, congressional negotiators privately traded one item for another, never explicitly explaining why any one measure survived or died. But the end result, when the doors reopened, was that Landrieu's position had prevailed.

In the final budget compromise unveiled in January, the Senate agreed to give MIT $22 million to run its experiment for 12 weeks in 2014 and allow for the remaining graduate students to complete their theses. The reactor would not be deactivated until 2016.

That was an example of very effective lobbying on MIT's behalf," said a Senate aide with direct knowledge of the negotiations. "They invited tons of congressmen and senators to visit the facility. They sent students up here on the Hill to visit each of the member's offices to talk about the impact that shutting the program would have on the future of fusion leadership in the United States. MIT raised this issue and put it at the top of [people's] minds."

The international fusion project, meanwhile, was funded at $200 million, $25 million less than the administration had originally requested.

MIT had won, at least temporarily. The Obama administration, which got some funding for climate change initiatives out of the deal, gave in — much to the dismay of Brinkman, the former Energy Department official who believed the money should have been eliminated.



CHRISTOPHER A. MAYNOR—THE TECH

A cramped port that grants access into the innards of the fusion reactor glowed brightly.

"You can say, 'Hey, look, that's what democracy is all about: people voice their concerns and go to Congress and get people to change their minds.' We do not live in a monarchy," Brinkman, who left the administration in April 2013 and is now a senior physicist at Princeton, said in a recent interview. "What can I say? It was a judgment that MIT wasn't really prepared to live with... Nobody wants to kill their own program."

A victory, calls for vigilance

For MIT and its allies, it was an exhilarating against-the-odds victory. But the fight to keep the program going has, in fact, only just begun.

The controversy over the program flared again during an April subcommittee hearing on next year's energy and water budget and whether MIT should be in it. Feinstein skeptically grilled an Energy Department official on why the administration backtracked and requested funding for the MIT project in 2015.

"As I understand it," she said, "in your 2015 budget, you asked for $18 million to conduct research at this facility. The $18 million is only for five weeks of operation and supports 12 graduate students. This would be $1.5 million per graduate student."

Deputy Secretary of Energy Daniel Poneman, who represented the administration on fusion at the hearing, told Feinstein that the extra three years of funding would give the students a smoother transition and allow them to finish their research.

Energy Secretary Ernest Moniz sat next to Poneman but didn't speak. As an MIT nuclear physicist appointed to Obama's Cabinet in 2013, Moniz felt he had to recuse himself.

Still, his presence may have sent a message.

"Let's be honest," Capuano said. "Having Moniz there at least helps re-draw the big bold line that this isn't the top priority to cut."

At countdown, spirits lift off

At MIT's reactor relaunch ceremony, the theatrics reached a climax when Senator Warren pushed the jerry-rigged launch button. She was simultaneously restarting the reactor, re-igniting MIT's fusion dream, and celebrating the culmination of a furious political push.

The experiments could go on. No one would be laid off.

"It's thrilling," Warren said, shaking the hands of university officials who greeted her as a hero. "This is our future. Our future in science, and our future in power."

"Mr. Fusion" — Beeuwkes — was on hand for the moment, wearing a suit and tie and a triumphant smile.

He sat in the back of the control room and, while downplaying his role, handed reporters, politicians, and their aides color copies of papers on fusion that he had printed out at home.

"These guys are building a power plant," he exclaimed, pointing at the rows of scientists hunched over their computers. "We went to the moon! Why can't we do this?"

As Warren turned to pose for photographs with researchers, L. Rafael Reif, the university president, clasped the senator's hands with both of his.

"Senator Warren, you fought a good fight for the whole year," he said. "I owe you a great deal."

Solution to Crossword

from page 5

S	P	U	D	■	V	C	R	S	■	S	N	O	R	E
O	R	S	O	■	A	L	U	M	■	C	O	P	A	Y
D	E	E	D	■	N	A	N	O	■	I	R	E	N	E
■	P	R	O	V	I	N	G	G	R	O	U	N	D	S
■	■	■	■	A	S	K	■	■	E	N	S	■	■	■
M	U	N	I	C	H	■	S	I	N	■	H	A	N	K
O	P	E	R	A	■	T	Y	P	E	A	■	W	I	I
D	O	E	S	N	T	K	N	O	W	B	E	A	N	S
E	N	D	■	T	O	O	T	S	■	L	A	K	E	S
L	E	S	T	■	A	S	H	■	W	A	T	E	R	Y
■	■	■	A	D	S	■	■	L	I	Z	■	■	■	■
E	X	E	C	U	T	I	V	E	P	E	R	K	S	■
S	T	R	O	P	■	H	I	V	E	■	U	N	I	T
P	R	I	M	E	■	O	V	E	R	■	B	O	Z	O
N	A	N	A	S	■	P	A	R	S	■	S	T	E	W

Solution to Techdoku

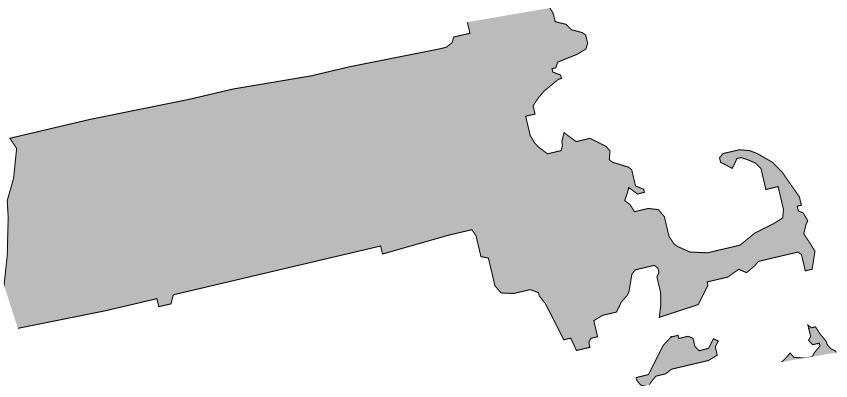
from page 5

5	4	3	2	1	6
4	3	2	1	6	5
6	5	4	3	2	1
3	2	1	6	5	4
1	6	5	4	3	2
2	1	6	5	4	3

Solution to Sudoku

from page 5

3	6	1	7	8	5	9	4	2
2	9	7	4	3	6	1	8	5
4	8	5	1	2	9	7	3	6
9	2	4	3	5	7	6	1	8
1	5	8	2	6	4	3	7	9
7	3	6	9	1	8	5	2	4
5	1	3	6	4	2	8	9	7
8	4	9	5	7	3	2	6	1
6	7	2	8	9	1	4	5	3



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RESTAURANT REVIEW

It takes Argentinian steak to tango

A quest for the perfect steak in Boston

By Katie Villareal and Juan Alvarez
STAFF WRITERS

The quest for the perfect steak may take you places: you might have to go on a pilgrimage to unfamiliar faraway lands, cross a language barrier with the chef to find your favorite cut, or spend a late night at someone's grandma's kitchen. Tango was all of that to us — a virtual trip to Argentina, a mine of perfect cuts, and a table for home-cooked meals.

After a trek through American and Brazilian steakhouses in Boston, our quest would have been incomplete without a visit to an Argentinian one. Beef is not only traditional cuisine for Argentinians — it is a lifestyle. Yearly beef consumption is estimated at 55 kilograms per head, and cowboys and landowners are central to Argentinian folklore, society and politics. Indeed, the vast Argentinian lowlands, known as the Pampas, are fertile and temperate grasslands ideal for grazing but not more intensive agriculture, making livestock the natural product of the land.

To reach Tango, you must head to East Arlington, which is a 20-minute drive from campus or a journey to Alewife via the T plus some walking or bus connection. But experiencing the art form that is Argentinian steak is well worth the trek. We began our latest visit with a selection of appetizers, including chorizo (pork sausage) and morcilla (blood sausage) ($12) and a Caprese salad ($10). The blood sausage was rich in flavor and had a perfectly balanced profile of fat and juiciness, which paired well with the relatively milder-tasting and saltier chorizo and the accompanying caramelized onions. The salad was standard fare but tasty, including fresh ingredients and an enviable balsamic vinaigrette. But without a doubt, the king of the night was the steak.

COURTESY OF TANGO RESTAURANT

Situated in Arlington, Tango Restaurant offers a mouthwatering dining experience.

The Argentinian method of grilling meat, perfected over the centuries across the Pampas, is what sets Argentinian steak apart. The meat is placed in vertical metal crosses rotated slowly at a distance from an open fire of glowing coals in order to get the most benefit from the glowing embers, with a sprinkle of salt before being finished. We were delighted by a succulent churrasco (sirloin cut, $25), which was tender and cooked to perfection. It was excellent by itself or with the traditional parsley, garlic, pepper and olive oil sauce, chimicurri. The entraña (skirt steak, $24), the most popular cut in Argentina, was also our favorite. It was seasoned perfectly and had maintained a great deal of its natural fat and salt content, often hard to achieve with this cut.

Other companions also tried the traditional chicken Milanese ($20), a tasty thinly-pounded breaded and fried chicken breast with a perfectly crispy crust, and the costillas de cordero ($29), juicy grilled lamb chops whose taste unfortunately was not fully realized when enjoyed rare. Each entrée was accompanied with a choice of two sides, which are variations of potatoes or vegetables typical of the Pampas. Notable accompaniments included the pure porteño (mashed butternut squash & sweet potato) and the Tango fries, which were lightly fried and expertly seasoned potato chips.

For dessert, we tried the flan con dulce de leche (caramel custard, $8), a nice sweet finish after the savory entrées that tasted home-cooked and delicious. Everything at Tango, from the setup of the rooms to the attentive and knowledgeable service, is designed to create a dedicated and expert carnivorous experience. By the end of our meal, we felt at home with the relaxing tango music playing in the background and the patiently cooked steaks by the fireplace. Whether a culinary cultural adventurer or a steak lover, Tango can surely take you places.

★★★★☆

Tango Restaurant

464 Massachusetts Avenue, Arlington, MA 02474

Mon–Thurs: 5 p.m.–10 p.m.

Fri–Sat: 5 p.m.–11 p.m.

Sun: 4 p.m.–9 p.m.

ART REVIEW

Sometimes titles are deceptive

9 Artists: An exhibition of the works of eight artists

By Tasha Schoenstein
STAFF WRITER

Sometimes, contemporary art is inaccessible. It can be excessively abstract or seemingly absurd. Some of the art in the List Visual Arts Center's current exhibition, 9 Artists, falls into this category. But on the whole, however, this exhibition brings together an interesting and diverse group of contemporary artists in a very powerful presentation.

Going on a tour provided the necessary context to help understand the message of the pieces.

The exhibition aims to explore the changing role of the artist in today's culture and highlights the works of eight contemporary artists: Yael Bartana, Liam Gillick, Natascha Sadr Haghighian, Renzo Martens, Bjarne Melgaard, Nástio Mosquito, Hito Steyerl, and Danh Vo. According to the center's website, "the exhibition examines ways that they negotiate the complexities and contradictions of living in an ever more complex and networked world." The exhibition features a diverse range of about 40 works, as sculptures, installations, and videos can all be found in the space.

Unfortunately, the exhibition suffers from a recurring problem of modern and contemporary art — it is often too abstract to have any meaning without additional context. As such, I found that looking at the exhibition by myself was not an especially enjoyable experience; however, going on a tour provided the necessary context. Without the context, the message of the pieces is lost.

For example, one of the pieces in the exhibition is a vacuum that occasionally turns itself on. There is no obvious aesthetic or intellectual value. However, the vacuum had been an element of a performance art piece that was meant to comment on the highly digitized nature of modern interactions — but without this extra knowledge, it simply appears to be a vacuum full of little pieces of paper.

Despite some of the drawbacks, I nevertheless enjoyed 9 Artists. This exhibition packs many incredibly interesting works into a small space — from a giant Bloody Mary (left open to the elements so that the viewer might see natural change over time, including evaporation and possible mold growth) to installation pieces that invite the viewer to take a poster to video-based pieces that explore fundamental questions and more. The dearth of space actually enhances the viewing experience — each piece is placed within a logical order that creates conversation about the nature of the present and the roles of the artist and the viewer now.

Ultimately, this is not a good exhibition for those who do not enjoy abstract, conceptual art. While the art pieces are incredibly interesting and quite well curated, most of the artworks are not easily accessible by the average viewer. However, viewing the exhibition with a tour can be a challenging and rewarding experience.

More information can be found at *http://listart.mit.edu.*

★★★☆☆

9 Artists

MIT List Visual Arts Center

Artwork by Yael Bartana, Liam Gillick, Natascha Sadr Haghighian, Renzo Martens, Bjarne Melgaard, Nástio Mosquito, Hito Steyerl, and Danh Vo

Open until July 13, 2014

Tues–Wed: 12 p.m.–6 p.m.

Thurs: 12 p.m.–8 p.m.

Fri–Sun: 12 p.m.–6 p.m.

(Closed Mondays)